method known to science. The surgeon-general of the Marine Hospital service (who was present) was requested and promised to erect at Tampa, Fla., a similar plant. The administration of marine quarantine, as now carried out by the surgeon-general, was especially commended, and the request was made that more stations and more men be devoted by him to this work. The co-operation of the management of the Plant Line of steamers, plying between Havana and Tampa, with Dr. Burgess, United States medical inspector at Havana, was commended as an example for cleanliness of ships, scrutiny of passengers, and disinfection of baggage. By special resolution, the attention of the secretary of the treasury of the United States was called to the prevalence of smuggling between Cuba and the Florida coast, and the great danger of introduction of yellow-fever by this illicit traffic; and he was requested to use additional precautions, and, if possible, put a stop to it. On the question of inland quarantine it was decided, that, as far as possible, this should always be declared, where they exist, by State boards of health; and that by whomsoever declared, within thirty-six hours after the proclamation, comfortable quarters, with provisions and bedding, must be provided for the unfortunates detained at the station. The conference, by a decided vote, refused to indorse the proposition that it was necessary to disinfect a town or city in which yellow-fever had prevailed, but in which there had been no cases for several months, and the place had been subjected to the frosts and freezes of winter; deeming that the use of disinfectants under these circumstances was not only useless, but tended to breed unnecessary terror and distrust not only among the people of the place, but of surrounding States.

TREATMENT OF OBESITY. — Dr. W. T. Smith communicates to the *British Medical Journal* a method for the treatment of obesity which he has successfully employed in forty-three cases, including himself. The plan which he follows is to confine the diet to rump-steak, cod-fish, and hot water for fourteen days, with the absolute exclusion of every thing else. Taking meat in large quantities may lead to dyspepsia, but this can be easily overcome by reducing the meat to an essence. This may be done as follows: Take four pounds of beef free from skin and fat; cut it to pieces about an inch square; place the meat in a close-fitting, air-tight jar; stand the jar in a pan of boiling water, and let it simmer for six hours. Pass the juice of the meat thus obtained through a sieve; then measure four ounces of the fibrine of the meat; pulverize it in a mortar, and stir it up with the essence; divide this into four doses, and you will obtain the nitrogenous elements required of the quantity of meat to be taken at one meal. There is also a similar way of obtaining meat-essence by using a pot called "Boule Américaine." In treating his cases, in several instances he has been obliged to modify the amount of hot water, and lessen occasionally the quantity of meat; but as regards his own personal experience, he found that three pounds of rump-steak and one pound of cod-fish were hardly sufficient to satisfy his appetite. The meat diet and hot water alone must be regularly adhered to for fourteen days; and the amount of hot water taken at any time during the day, commencing at seven in the morning and finishing at half-past ten at night, varies from six and one-third pints, more or less, according to the powers of the patient. The second epoch of twenty-one days the diet may be considerably varied, as he reduces the hot water to four pints in the twenty-four hours; and he allows other kinds of meat, such as mutton-chops free from fat, and chicken; and, as regards fish, grilled turbot, whiting, or soles; a little green vegetable, and some slices of plain unsweetened rusk. The third epoch, thirty-one days, the hot water is reduced to about a quart a day, and he allows tea, stale bottom crust of household loaf, captain's biscuits, grilled fish, fowl, game, turkey, any joint, hock or claret, with seltzer-water, in place of whiskey. As hot water is very unpalatable, a slice of lemon may be added to each tumbler. No case of obesity should be treated by this method when the patient is suffering from any organic disease, unless it be some trifling malady. The loss of weight in nearly all cases will vary somewhat; but Dr. Smith states that his patients bear the treatment exceedingly well, and express themselves as feeling far better in health, and able to take exercise with comfort. The first period of fourteen days is really the only hardship, and he has found very little difficulty in persuading patients to stick to the diet. As some alkali is essential, he prescribes five grains of the bicarbonate of potassium, to be taken night and morning. Dr. Smith offers to send his diet-cards to any medical practitioner who will write to him, but asking that the result of any case put under treatment be reported to him.

ELECTRICAL NEWS.

The Clark Cell as a Source of Standard Currents.

FOR measuring small currents, there are two methods which should give good results. The first is by the use of an electro-dynamometer, where the mutual actions of circuits carrying the current are balanced by known weights. In this instrument the changes in the magnetic field do not affect the results; and but for its inconvenience, and the fact that continuous readings are impossible, electro-dynamometers would be universally used. In the second method an ordinary galvanometer of any convenient pattern could be employed, provided it could be easily calibrated in order to eliminate errors due to changes in the earth's field or to the field due to magnets on the instrument itself. In order to effect this calibration, Messrs. Threlfall and Pollock have endeavored to obtain a galvanic cell whose electro-motive force will remain constant; and, by sending a current from this through a known resistance, the value of the current is known, and it can be used to standardize a galvanometer meter. In the form of instrument chosen, a movable coil was employed, with an adjustable directing magnet. To calibrate it, the coil was moved to a marked position, a current from the standard cell was sent through it, and the directing magnet moved up or down until the deflection reached a certain set value. This can be easily and rapidly done.

The standard cell was of the Clark type, now almost universally used for comparisons of electro-motive force. From the ordinary type, only an extremely small current can be taken, or the electro-motive force will drop and the cell be ruined. In the type devised by Messrs. Threlfall and Pollock, a much larger surface than ordinarily used was employed. In a paper read before the London Physical Society the gentlemen named give the result of a long series of experiments on these cells. The conclusions at which they arrive are as follows: —

1. When a current is taken from a Clark cell, the terminal electro-motive force drops practically instantaneously to within an inappreciable amount of its final value. 2. To the first degree of approximation, this value is constant. 3. There is no appreciable secular change. 4. When the current is stopped, the terminal electro-motive force rises instantly to within a few thousandths of a volt of the original value. 5. The cell completely recovers in time. 6. The above statements are only true when the current does not exceed a certain value, depending on the size of the cell. For a cell in which the zinc and mercury surfaces have each a value of five inches or upward, .001 of an ampère will not be too great; for the ordinary cell used as a standard of electro-motive force, the current should not exceed one hundredth of this value. 7. When too large a current is taken from any cell, the electro-motive force goes on dropping for some time, after which it rises slightly, and seems to tend toward a fixed value.

THE DETROIT SECONDARY BATTERY. — One of the new secondary batteries which has been attracting considerable attention during the past few months is the Detroit battery, manufactured by the Woodward Electric Company of Detroit, Mich. It is of the Faure type, with a support-plate of lead and active material consisting of salts of lead in cavities in the support. The method of making the support-plate is decidedly novel. Rock salt is put into a square mould, and is baked. Melted lead is then run into the mould and allowed to solidify. The cube thus formed is sawed into plates, and the salt is dissolved out of them by putting in warm water. The result is a plate full of cavities of irregular shapes, having in general an overlapping portion, which prevents the active material from falling out. A solid rim with a lug for a terminal is cast around this central porous portion, and then red lead or litharge is pasted into the cavities. The plates are then put in a cell containing sulphuric acid, and formed by sending a current of electricity from the positive to the negative set. The Detroit batteries have

been pretty extensively employed for lighting, and lately experiments have been made with a view to their adoption for street-car work. A car in Brooklyn equipped with these cells has made over eighty miles with one charge, — a record which has not been equalled; although the distance a car can go does not determine the value of the battery used, since the very important question of weight should enter, and in this case the weight is over five thousand pounds. The Detroit cells have been recently tested at the Johns Hopkins University, and a few figures as to their performance will be of interest. Taking a cell with 15 plates, of which the total weight is 80 pounds, the following results were obtained: charge rate, 15 ampères; discharge rate, 20 ampères; storage capacity, about 220 ampère hours; efficiency, between 75 and 80 per cent. This cell, after experiments at normal charge and discharge rates had been made, was charged at a rate of from 75 to 85 ampères, and discharged at over 250 ampères; and this was done a number of times. At the end of the tests there were no signs of deterioration, which, considering the rough usage to which the cell had been subjected, speaks well for their durability, although the length of the experiments was not sufficient to test their length of life under normal conditions.

THE MAGNETIC PROPERTIES OF NICKEL. — Professor Ewing, whose researches on the magnetic properties of iron are so well known, has examined the magnetization of nickel under various conditions. He finds that nickel behaves very much as iron does when submitted to a magnetizing force. The permeability, or magnetic conductivity, is small at first, then increases to a maximum, then decreases again. The maximum value of the induction obtained was 5,380, so that nickel is about one-quarter as magnetic as iron. When a piece of nickel was heated to redness and then allowed to cool slowly in the air, its permeability increased. On stretching a piece of nickel, its permeability decreased rapidly. For example: a certain specimen of wire had a value of the maximum magnetic susceptibility for no load, of 15. With a load of 13 pounds, this was reduced to 2.6, while at 26 pounds it was but .95. On submitting specimens to compression, the reverse effect was found: as the pressure increased, the magnetic susceptibility increased from 5.6 at no load, to 29.0 at a load of 45 pounds per square millimeter.

A CHALLENGE TO THE WESTINGHOUSE COMPANY. — Mr. Harold P. Brown has issued a challenge to the Westinghouse Electric Lighting Company, to a competitive test of the apparatus of that company against a corresponding continuous-current plant. Each company is to provide a plant capable of furnishing 650 lights. These are to be sent to the Testing Bureau of the Johns Hopkins University, where they are to be tested for efficiency. The loser is to purchase the winning plant, which is to be presented to the university; and he is also to pay all of the expenses of the test. If the Westinghouse Company desires it, they may use one of the Westinghouse engines, while Mr. Brown will employ for the continuous-current plant some other make of automatic high-speed engine. If the Westinghouse Company does not accept the challenge, Mr. Brown will consider himself at liberty to purchase an alternating plant and have the test made. It is to be hoped that the test will be made, as systematic knowledge of the performance of alternating apparatus is wanting, although the marked success of the system speaks well for its efficiency.

THE CONDUCTIVITY OF MICA AT HIGH TEMPERATURES. — W. H. Schultze, in *Wiedemann's Annalen*, describes a number of experiments on the conductivity of mica at high temperatures. It is well known that the conductivity of glass increases rapidly with the temperature, a fact which in many cases is a serious inconvenience. The results of Mr. Schultze's experiments are, that while mica split parallel to the planes of cleavage shares with glass the property of becoming a better conductor as the temperature rises, yet the conductivity reaches a maximum, and after that diminishes until at very high temperatures it becomes infinitely small; so that, comparing glass and mica, it is seen that even at high temperatures the latter is the better insulator.

A. J. DREXEL, the banker, is about to found an industrial college for women at Wayne, Penn., at a cost of $1,500,000.

NOTES AND NEWS.

SOME interesting experiments were made March 22 near Dartford with the Maxim Nordenfelt quick-firing and automatic guns. As described in *Engineering*, the first weapon fired was the Maxim automatic gun of .45 caliber, and with this 334 rounds were fired in twenty-seven seconds. A comparative test was then made between ordinary rifle-powder and the new Maxim smokeless powder. A cartridge containing 85 grains of black powder, and others containing 55 grains of the new powder, were fired. The last-mentioned cartridges gave a slightly greater velocity, and at the same time produced extremely little smoke. Among the other guns tried was an automatic six-pounder, which has a dropping block like the Sharpe's rifle. It requires only two men to work it, one man firing and the other loading. Every thing about the gun is fixed save the gun itself, which is placed inside a jacket, which latter is also fixed. There can be no danger of escape of gas or from a hang-fire. The gun, on being fired, recoils about 4½ inches, and then returns to its original position. The cartridge-case is not ejected till the gun has travelled some little distance on its return journey. The act of putting in the new cartridge pushes forward the ejectors and releases the block, which rises and closes the breech. If great rapidity is required, one man on a saddle with a butt to his shoulder aims and fires, while a man on each side puts in the cartridges. If only one gunner is left unkilled, a single man can work the gun in the following manner: having laid the gun and fixed the trigger in a firing position by a bit of wood or string, he simply puts in cartridge after cartridge, the gun on each occasion going off as the cartridge is pushed forward. It can be fired, with two men to load, sixty times a minute.

— The kaolin and pottery clays of Texas are beginning to attract considerable attention. There have been representatives of several of the different Northern and Western potteries through the State during the last few weeks, looking up the ordinary pottery clays as well as the kaolin of Edwards and adjoining counties. The deposits of these materials are abundant, and of such quality that they are certain to be brought into market at an early day.

— An English correspondent of the *American Field* writes that a new gunpowder, the invention of Mr. Hengst, has recently been tested at the Royal Gunpowder Factory, Waltham Abbey, England, and the results point to it as a promising substitute for black powder for military and sporting purposes. The new powder is prepared from straw, which is pulverized, chemically treated, and finished in granular form for use. It is claimed for this powder that it is smokeless, flameless, practically non-fouling and non-heating, and that both the recoil and the report are less than those of black powder, with superior penetrative power. From the powerful character of this explosive, which, weight for weight, is 150 per cent stronger than gunpowder, and is not explodable by concussion, it is probable that in a compressed form it will be found to be applicable to blasting-purposes.

— President Patton says that after June 1 the Princeton College will have added to its permanent endowment fund $250,000 through the kindness of many old and some new friends.

— Mrs. Eliza A. Clark of Cleveland has given $100,000 to the Cleveland College for Women, a department of the Western Reserve University. One-half the amount is to be expended in erecting the Clark Hall of Liberal Arts.

— The committee on science and art, of the Franklin Institute, has recommended the following awards: of the John Scott legacy medal and premium, to Thomas A. Edison of Orange, N.J., for his invention of the mimeograph, an improved duplicating system and apparatus; of the Elliott Cresson medal, to Edward Alfred Cowper of London, England, and J. Hart Robertson of New York, for their invention of a system of facsimile telegraphy, called "The Writing Telegraph;" of the John Scott legacy medal and premium, to A. A. Marks of New York, for his improvements in artificial limbs; of the John Scott legacy medal and premium, to Thomas Shaw of Philadelphia, for his mine-inspector's gas-testing apparatus; and of the John Scott legacy medal and premium, to Roman